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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,602	09/15/2003	Sung Uk Moon	242752US90	8504

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EXAMINER	
PANWALKAR, VINEETA S	
ART UNIT	**PAPER NUMBER**
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/24/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/24/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/661,602	MOON ET AL.	
	Examiner	Art Unit	
	Vineeta S. Panwalkar	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *5-10 and 15-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 11-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/15/03,11/3/06,1/19/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1a. Claims 5-10 and 15-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 1/29/07.

1b. Applicant's arguments filed 1/29/07 have been fully considered but they are not persuasive. Applicant argues that that the present application would have to be searched in a handful of sub-classes and that due to the availability of electronic searching, all subclasses can be searched without substantial additional effort. Applicant also argues that the non-elected claims are drawn to demodulation, which is conceptually related to modulation. The restriction requirement mailed 12/29/06 is deemed proper for the following reasons:

- The applicant is referred to MPEP § 802.02 wherein is stated that burden may be established based on "**A different field of search**: Where it is necessary to search for one of the inventions in a manner that is not likely to result in finding art pertinent to the other invention(s) (e.g., searching different classes /subclasses or electronic resources, or employing different search queries, a different field of search is shown, even though the two are classified together. The indicated different field of search must in fact be pertinent to the type of subject matter covered by the claims. Patents need not be cited to show different

fields of search." As stated in the office action mailed 12/29/06, claims 1-4 and 11-14, drawn to a modulation device and method (Fig. 4), classified in class 375, subclass 295, while claims 5-10 and 15-20, drawn to a demodulation device and method, classified in class 375, subclass 316 (Fig. 5). As per the US classification system, class 375/295 relates to subject matter for forming and transmitting pulses, while class 375/316 relates to subject matter including apparatus to decode, demodulate, or otherwise recover the transmitted intelligence. Thus, subject matter classified in class 375, subclass 295, is considered to be in a separate field of search than subject matter classified in class 375, subclass 316. Despite the availability of electronic search tools, the two groups acquire a separate status in the art as shown by their classifications, search required for Group I is not required for Groups II and vise versa, therefore, restriction for examination purposes as indicated is proper.

- Applicant is further referred to MPEP § 806.05 (especially 806.05(c)).

Claim 11 addresses modulation method (A) comprising the step of transmitting to a "demodulator counterpart" (B- broad limitation). Thus, in the combination of AB, B is broad. Claims 5-10 and 15-20 address a specific demodulator/demodulation method (subcombination B, which is specific). Since the combination **as claimed** (in claim 11-14) does not require the details of the subcombination as separately claimed (in claims 5-10 and 15-20) and the subcombination has separate utility, the inventions are distinct and restriction is proper because reasons exist for insisting upon the restriction, i.e., there would be a serious search burden as

evidenced by **separate classification, status, or field of search**. (Similar argument is true for claims in group II (claims 5-10 and 15-20). Claim 5 addresses a demodulation device (A) responding to a "modulation data" (B – broad limitation)). Thus, in the combination AB, B is broad. Claims 1-4 and 11-14 address a specific modulator/modulation method (subcombination B, which is specific). Since the combination **as claimed** (in claims 5-10 and 15-20) does not require the details of the subcombination as separately claimed (in claims 1-4 and 11-14) and the subcombination has separate utility, the inventions are distinct and restriction is proper because reasons exist for insisting upon the restriction, i.e., there would be a serious search burden as evidenced by **separate classification, status, or field of search**).

Drawings

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3 and 11-13 rejected under 35 U.S.C. 102(e) as being anticipated by Aoyama et al. (US 6968212 B1), hereinafter, Aoyama.

3a. Regarding claims 1 and 11, Aoyama shows base station apparatus and packet transmission method used in a CDMA radio communication system wherein is shown a modulation device comprising:

- a modulation unit that modulates data in a hierarchical manner using multiple types of modulation techniques(Fig. 2, column 2, line 35 – column 4, line 25; modulation section 153 is interpreted as claimed modulation unit. Modulation system determining section 152 selects one of 16QAM or 64QPSK or QPSK (claimed multiple types of modulation techniques) based on determined

priority (claimed hierarchy). Then, modulation system determining section 152 instructs modulation section 153 about the modulation system. Thus, modulation unit 153 performs a different type of modulation, as instructed by section 152, which determines the type of modulation based on the priority determined. Hence modulation unit 153 is interpreted as claimed modulation unit performing claimed hierarchical modulation); and

- a transmission unit that transmits the hierarchically modulated data (Fig. 2, column 2, line 35 – column 4, line 25; antennas 101, 102, 103 and duplexer 104 are interpreted as claimed transmission unit).

Regarding claim 11, Aoyama discloses corresponding method.

3b. Regarding claims 2 and 12, Aoyama further shows the modulation device, comprising:

- a sampling pattern generating unit that generates a sampling pattern for each of the multiple types of modulation techniques, the sampling pattern defining a sampling space for quantizing said data in accordance with each of said modulation techniques, wherein the modulation unit modulates said data in the hierarchical manner using a digital signal sampled based on the sampling pattern (Fig. 2, column 2, line 35 – column 4, line 25. Since modulation system determining section 152 selects a type of modulation technique, as claimed (16QAM, 64QPSK or QPSK). Thus modulation system determining section 152 is interpreted as claimed sampling pattern generating unit

because it defines the sampling space of the carrier used in modulation, i.e. it defines the type of modulation scheme to be used (16QAM and 64QPSK or QPSK)).

Regarding claim 12, Aoyama discloses corresponding method.

3c. Regarding claims 3 and 13, Aoyama further shows the modulation device, wherein:

- the sampling pattern defines the sampling space of a carrier used in one of multi-phase phase shift keying and multi-value quadrature amplitude modulation. (Fig.2, column 2, line 35 – column 4, line 25; 16QAM is claimed multi-value quadrature amplitude modulation and 64QPSK is claimed multi-phase phase shift keying).

Regarding claim 13, Aoyama discloses corresponding method.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions

covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama in view of Marchetto et al. (US 5914959), hereinafter, Marchetto.

4a. Regarding claims 4 and 14, Aoyama shows all the limitations claimed (See 3b above), but fails to explicitly disclose whether the sampling pattern is transmitted along with the modulated data.

In the same field of endeavor, however, Marchetto shows a digital communication having an automatically selectable transmission rate wherein:

- the transmission unit transmits the sampling pattern, together with the hierarchically modulated data.(See column 1, line 55 – column 3, line 22. A base transmitter (claimed transmission unit) transmits a data signal using an initial set of constellation points. The pilot block symbol identifying the constellation pattern (claimed sampling pattern) is transmitted with the data stream, i.e. claimed sampling pattern is transmitted with the data stream).

Thus, it would have been obvious to a person of ordinary skill in the art to use a pilot symbol identifying the constellation pattern (or to transmit the sampling pattern) along with modulated data as shown by Marchetto in the modulation device shown by Aoyama, because Marchetto's technique will ensure proper demodulation of the data at the receiver (Column 3, lines 10-22).

Regarding claim 14, Aoyama and Marchetto disclose corresponding method.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Ohno (US 6778816 B1) shows a communication system with a plurality of signal modulation modes determined based on predetermined priority.
- Chen et al. (US 2006/0050805 A1) show a method and apparatus for layered (hierarchical) modulation.
- Ikeda et al. (US 6118825) show hierarchical modulation using BPSK and QPSK.
- Shiraishi et al. (US 6993096 B1) disclose show hierarchical modulation using BPSK and QPSK.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VP

JAY K. PATEL
SUPERVISORY PATENT EXAMINER